

A NEW GENUS AND SPECIES OF COMMENSAL SCALEWORM (POLYCHAETA:POLYNOIDAE) FROM BROOME, WESTERN AUSTRALIA

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ABSTRACT

A new genus and species *Capitulatinoe cupisetis* gen. et sp. nov. from Broome, Western Australia is described. The new species is commensal, living in the ambulacral grooves of a starfish, *Astropecten granulatus* Müller and Troschel, 1842.

KEYWORDS: Polychaeta, Polynoidae, new genus, new species, commensal, Broome, Western Australia.

INTRODUCTION

Two visits to Broome, Western Australia, in 1984 and 1987 were undertaken for the purpose of collecting polychaetes for the Northern Territory Museum (NTM). Amongst the material collected, were a number of polynoid scaleworms found in the ambulacral grooves of the common starfish, *Astropecten granulatus*.

The scaleworms possess a unique set of characteristics distinguishing them from all existing genera and species of the family Polynoidae and therefore are described herein as a new genus and species.

SYSTEMATICS

Family Polynoidae Malmgren, 1867
Subfamily Arctonoinae Hanley, 1989
Capitulatinoe gen. nov.

Type species *Capitulatinoe cupisetis* sp. nov.

Gender: feminine.

Diagnosis. Body elongate, subcylindrical in cross-section, fragile, with numerous segments (up to 181), without pigment. Elytra numerous pairs, on prominent elytriphores, on segments 2, 4, 5, 7, 9, alternate segments to 25, 26, 28, 29, 30, 32, 33, thereafter usually two elytragerous segments alternating with single cirriferous segments to end of body, with some irregularity on posterior segments. Elytra large, soft, transparent. Prostomium

hexagonal, truncate anteriorly, not bilobed, without cephalic peaks, with two pairs of eyes, paired palps, and three antennae. Ceratophore of median antenna inserted on distal end of prostomium; ceratophores of lateral antennae inserted slightly dorsal to ceratophore of median antenna. First or tentacular segment not visible dorsally; tentaculophores lateral and ventral to prostomium, achaetous, each with pair of dorsal and ventral tentacular cirri; without facial tubercle. Second or buccal segment with middorsal bulbous area, first pair of clytra on prominent elytriphores, subbiramous parapodia (notopodium much smaller than following notopodia), and ventral buccal cirri slightly longer than following ventral cirri. Third segment also with middorsal bulbous area. Parapodia subbiramous, notopodium small, on anterodorsal side of neuropodium, bluntly digitiform, with acicula, without notosetae; neuropodium larger, deeply cut dorsally and ventrally, with slightly longer, bluntly rounded presetal lobe, and shorter, bluntly rounded postsetal lobe. Neurosetae long, stout, with prominent subdistal swelling, well-developed basal semilunar pocket, rows of fine serrations, and strongly bidentate tips. Dorsal cirri on segments without elytra; cirrophores large, cylindrical, styles smooth, cylindrical basally, gently tapering distally; dorsal tubercles absent. Ventral cirri short, tapered. Nephridial papillae not present, pygidium with terminal anus and pair of anal cirri. Commensal on asteroid.

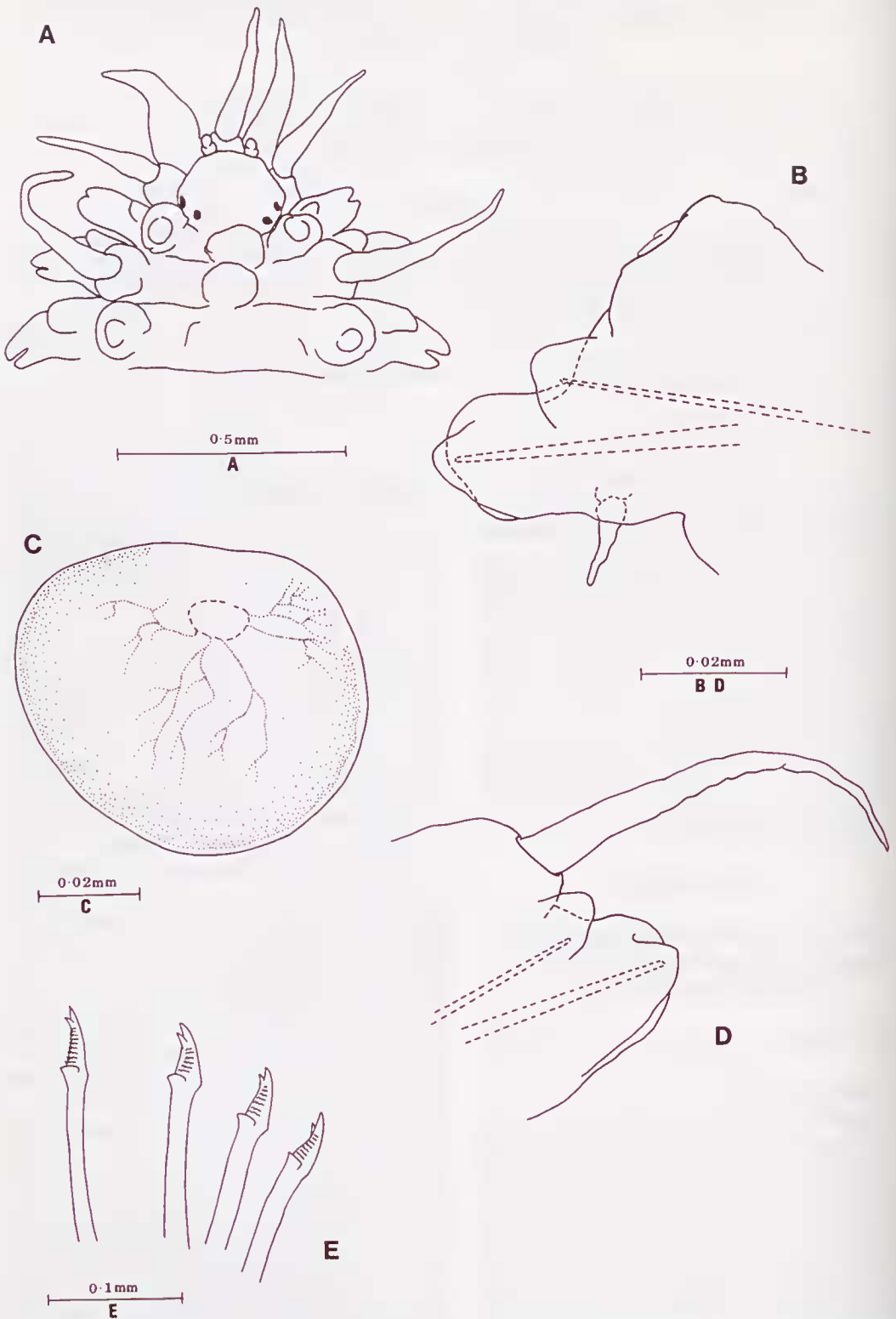


Fig. 1. *Capitulatinoe cupisetis* holotype: A, anterior end, dorsal view; B, elytragerous parapodium from posterior segment, anterior view; C, elytron from anterior segment; D, cirriferous segment from anterior end, anterior view; E, neurosetae from anterior segment.

Etymology. The generic name *Capitulatinoe* refers to the relatively small prostomium of the type species.

***Capitulatinoe cupisetis* sp.nov.**
(Figs 1A-E, 2A-D, 3A-E)

Type material. HOLOTYPE - NTM W2102, Mangrove Point, Broome, Western Australia, 17° 58.5'S 122° 14.5'E from ambulacral groove of asteroid, silt and sandy beach, 28.ix.1984 coll. R.Hanley. PARATYPES - NTM W2234, Mangrove Point, Broome, Western Australia 17°58.5'S 122°14.5'E, from ambulacral groove of asteroid, silt and sandy beach, 28.ix.1984 coll. R.Hanley. NTM W2173, Beach to right of caravan park, Mangrove Point, Broome, Western Australia 17°58.5'S 122°14.5'E, from ambulacral groove of asteroid, silt and sandy beach, 30.ix.1984 coll. R.Hanley.

Additional material. NTM W2323, Caravan park, Mangrove Point, Broome, Western Australia 17°58.5'S 122°14.5'E, from ambulacral groove of asteroid, silt and sandy beach, 1.x.1984 coll. R.Hanley. NTM W4383, W4384, W4386, W5354, W5355, Beach in front of Roebuck Bay, Broome, Western Australia 18°04'S 122°19'E, from ambulacral groove of asteroid, sandflat, 18.iii.1987 coll. R.Hanley, six specimens.

Description. *Holotype*: Body flattened, elongate, almost quadrate, flesh-coloured. Length 18mm, width including parapodia 1.3mm, 122 segments.

Elytra 77 pairs on segments 2, 4; 5, 7, alternate segments to 25, 26, 28, 29, 30, 32, 33, thereafter two elytragerous segments alternating with single cirriferous segments to 59, 60, 61, then two elytragerous segments alternating with single cirriferous segments to 102, 103, 104, 105, 106, 107, 108, 110, 111, 113, 114 and 116. Elytra large, soft, overlapping medially and posteriorly, covering dorsum. Elytra almost transparent, without tubercles or fringe of papillae, with faint band of dark pigment around border (Fig. 1C).

Prostomium roughly hexagonal, wider than long, truncate anteriorly, without cephalic peaks (Fig. 1A). Two pairs of eyes, anterior pair small, circular, lying dorsolaterally well behind widest part of prostomium, posterior pair slightly smaller, lying close behind ante-

rior pair and closer to midline. Palps short, stout, tapered. Median antenna with large, cylindrical ceratophore inserted terminally on prostomium, with style smooth, basally cylindrical, tapering to fine tip; lateral antennae with very small, distinct ceratophores, inserted terminodorsally on prostomium above median ceratophore, styles very short, almost vestigial (Fig. 1A). Tentacular segment not visible dorsally, tentaculophores of moderate length, lateral and ventral to prostomium, achaetous, with two pairs of smooth dorsal and ventral tentacular cirri, dorsal pair similar in length and shape to median antenna, ventral pair much shorter. Facial tubercle absent.

Segment 2 with middorsal bulbous area (Fig. 1A), first pair of large elytraphores, subbiramous parapodia (notopodium much smaller than notopodia of following segments), and ventral buccal cirri only slightly larger than following ventral cirri.

Segment 3 with middorsal bulbous area (Fig. 1A).

Parapodia subbiramous (Fig. 1B,D). Notopodium small, bluntly digitiform, on anterodorsal side of larger neuropodium, with notoaicula, without notosetae. Neuropodium (Fig. 1B,D), deeply cut dorsally and ventrally, with slightly longer, rounded presetal acicular lobe and shorter bluntly rounded postsetal lobe.

Neurosetae few, very stout, curved, with subdistal swelling, conspicuous semilunar pocket, several rows of fine serrations, and hooked, strongly bidentate tips (Fig. 1E). Upper neurosetae slightly thinner and straighter than lower ones.

Dorsal cirri on segments without elytra, with large, cylindrical cirrophores; styles basally stout, tapering gradually to tips (Fig. 1D). Dorsal tubercles absent. Ventral cirri short, subulate. Nephridial papillae not visible. Ventrum swollen.

Pygidium small, terminal, with pair of anal cirri similar to dorsal cirri.

Commensal on the starfish *Astropecten granulatus* Müller and Trosehel, 1842.

Paratypes: Two specimens, NTM W2173 is 20mm long and 1.2mm wide, including parapodia with 116 segments and 75 pairs of elytra; NTM W2234 is 41 mm long and 1.7mm wide, including parapodia with 181 segments and more than 100 pairs of elytra.

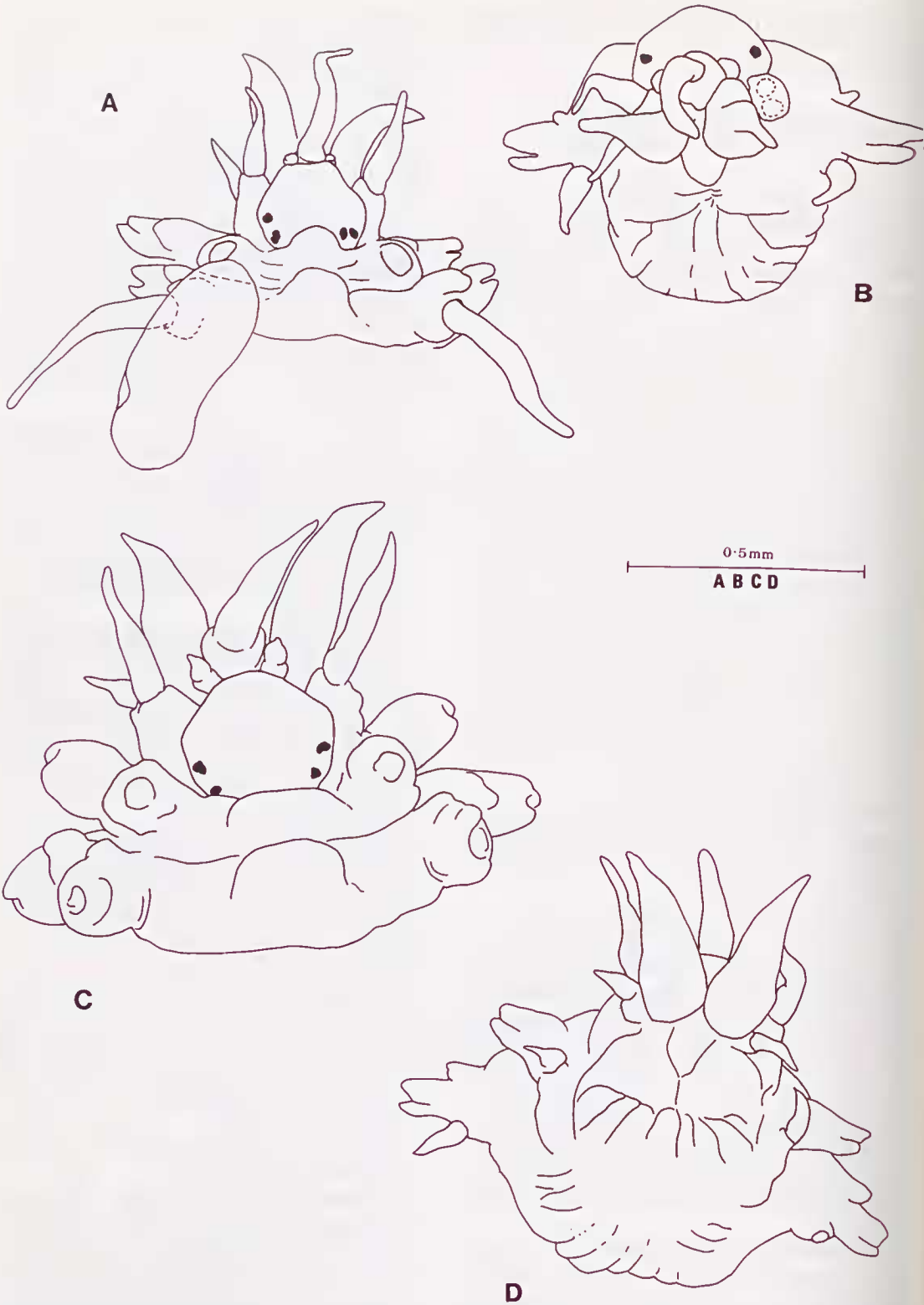


Fig. 2. *Capitulatinoe cupisetis*: A, anterior end, NTM W4384; B, frontal view of anterior end, NTM W4384; C, anterior end, paratype, NTM W2234; D, ventral view of anterior end, NTM W4384.

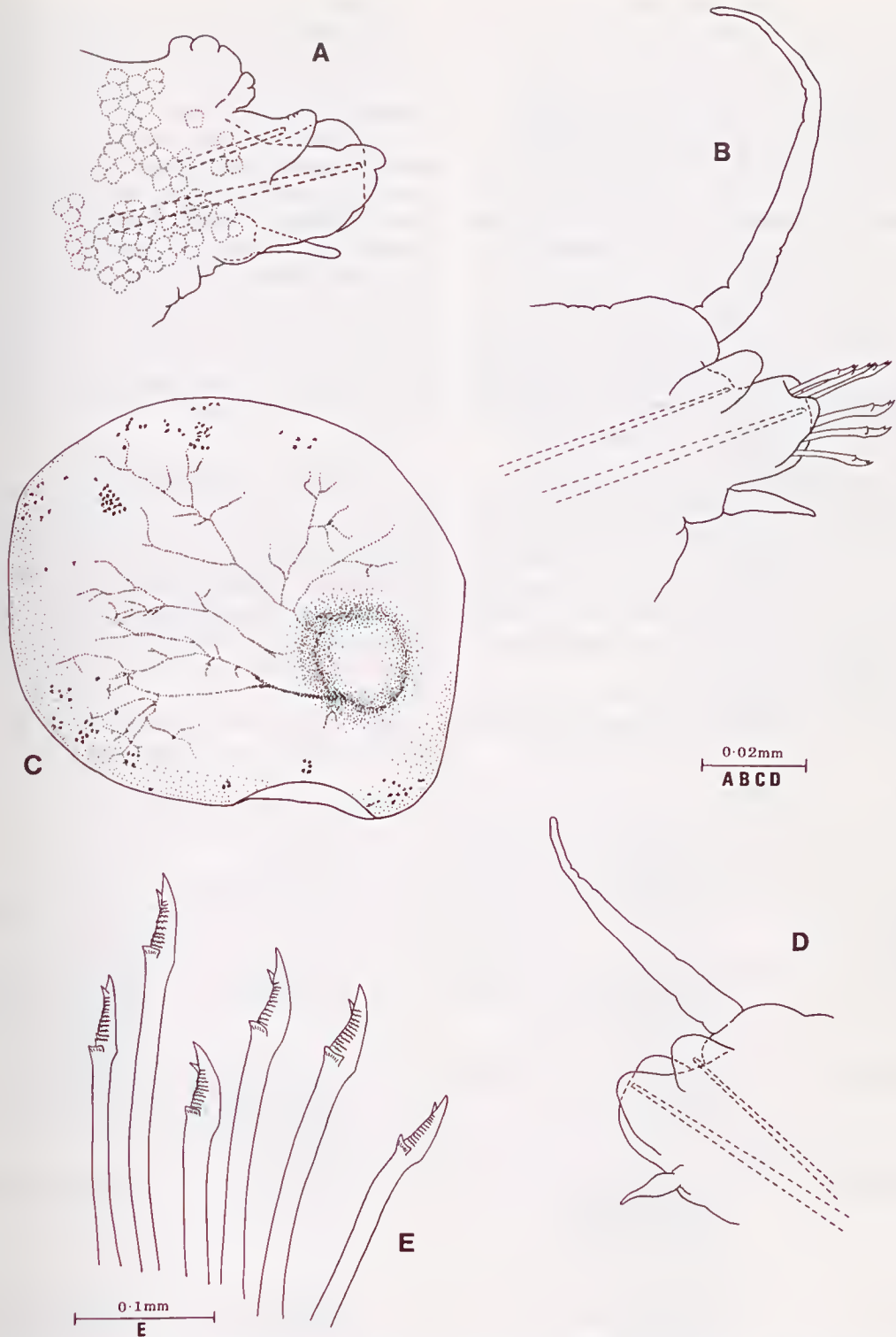


Fig. 3. *Capitulatinoe cupisetis*: A, elytragerous parapodium from middle segment, anterior view, NTM W5355; B, left cirriferous parapodium from 18th segment, anterior view, NTM W4384; C, right elytron from posterior segment, NTM W5355; D, anterior view of cirriferous parapodium from anterior segment, paratype, NTM W2173; E, neurosetae from anterior segment.

The two paratypes are very similar to the holotype in shape of prostomium, antennae, and parapodia. The neurosetae are also similar.

The elytra of both paratypes and those of the additional material are arranged in the same pattern on the anterior part of the body. Up to segment 33, the arrangement on all the material examined here shows the same pattern as that recorded for the holotype, thereafter, on all material the basic pattern of attachment is for two elytragerous segments to alternate with single cirriferous segments. However, on most of the specimens examined there is some departure from this arrangement with up to six elytragerous segments between cirriferous segments on the posterior end of the body.

Most of the additional specimens are incomplete, missing either heads or posterior ends. There is good general agreement between these fragments and the type material in respect of characteristics of prostomium (where present), parapodia, sctac, elytron attachment pattern, and ornamentation of elytra (Figs 2A-D, 3A-E).

Habitat. Commensal in the ambulacral grooves of the starfish *Astropecten granulatus*.

Distribution. Known only from the type locality, Broome, Western Australia.

Etymology. The species name *cupisetis* refers to the presence of euplelike (semilunar) pockets on the neurosetae.

Remarks. The presence of semilunar pockets on the neurosetae of this species places it close to the other polynoid genera which also have semilunar pockets, reviewed by Pettibone (1969). The new genus differs from the four other genera in several important respects and these are compared in Table 1.

Subadyte Pettibone, 1969 and *Paradyte* Pettibone, 1969 are easily distinguished from the new genus because they are short bodied forms with a fixed number of pairs of elytra (Table 1).

The other two genera are both long bodied forms like the new genus *Capitulatinoe*. However, *Adyte* Saint Joseph, 1899, *sensu* Pettibone 1969, has only 15 pairs of elytra.

Pottiscalisetosus is clearly the closest to *Capitulatinoe*. Both genera are long bodied with numerous pairs of elytra; have a middorsal bulbous area on segment 2, similar parapodial features, and are commensal on starfishes.

There are several features which distinguish these two genera. The ceratophores of

Table 1. Comparison of major characters between genera with semilunar pockets on the neurosetae (compiled from Pettibone 1969).

Genus	Pairs of elytra	Elytra attached to segment No.	Notosetae	Neurosetae	Other
<i>Adyte</i> Saint Joseph, 1899; emend. Pettibone 1969	15	2,4,5,7, alternate segments to 23,26,29 & 32	nearly smooth with scattered, closely opposed spinous rows.	faint rows of serrations, minutely bifid, hooked tips.	North Atlantic, North Sea, Mediterranean, commensal with echinoids
<i>Subadyte</i> Pettibone, 1969	15 or 16	2,4,5,7 alternate segments to 23, 26, 29, 32 and sometimes 34	spinous pouches along convex edge.	rows of spinous pouches, tips hooked, bifid.	Atlantic, Indian, and Pacific Oceans, Mediterranean, several species commensal on echinoids and ophiroids, others free-living.
<i>Paradyte</i> Pettibone, 1969	15	2,4,5,7, alternate segments to 23,26,29 and 32	few spines along convex edge.	two kinds: supra-acicular slender, elongate spinous regions and slightly hooked bifid tips; subacicular much shorter with short falcate smooth tips.	Indo-West Pacific, one species commensal on crinoids, other species hosts uncertain.
<i>Pottiscalisetosus</i> Pettibone, 1965	numerous	2,4,5,7, alternate segments to 23,26,29, 32,33,35 continuing on alternate segments to end of body (sometimes irregular after segment 39).	finely serated	slightly to distinctly hooked, finely serrated.	Japan, Ceylon, commensal with asteroids.
<i>Capitulatinoe</i> n. gen.	numerous	2,4,5,7, alternate segments to 25,26,28, 29,30 then two elytragerous segments alternate with single cirriferous segments to end of body (usually some irregularity posteriorly).	absent	slightly to distinctly hooked, finely serrated, strongly bifid.	Broome, Western Australia, commensal with asteroids.

the lateral antennae on *Capitulatinoe* are inserted on a slightly higher level than the ceratophore of the median antenna, while on *Pottsicalisetosus*, the ceratophores of the lateral antennae are inserted terminoventrally, slightly ventral to the ceratophore of the median antenna (see Fig. 9a in Pettibone 1969). In addition to the middorsal bulbous area on segment 2, there is a slightly smaller bulbous area on segment 3 on *Capitulatinoe*. *Pottsicalisetosus* has notosetae, these are lacking on *Capitulatinoe*. The elytral arrangement on the anterior part of the body form segment 23 differs on the two genera and, while both genera show some variability posteriorly, the basic pattern differs (Table 1).

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